

PCT

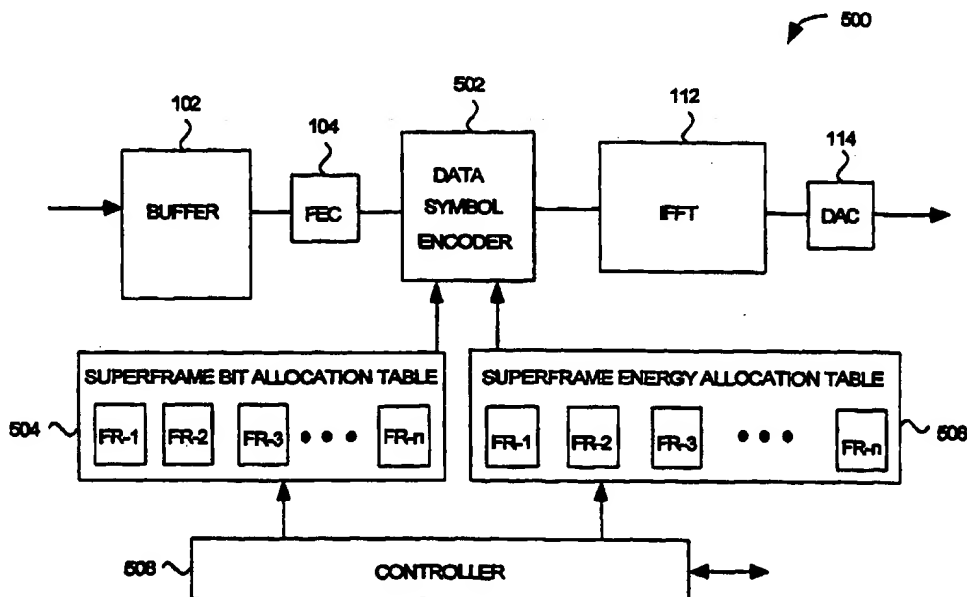
WORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau



INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶ : H04L 27/26, 5/02	A3	(11) International Publication Number: WO 98/52312 (43) International Publication Date: 19 November 1998 (19.11.98)
(21) International Application Number: PCT/US98/09489 (22) International Filing Date: 8 May 1998 (08.05.98) (30) Priority Data: 08/855,881 12 May 1997 (12.05.97) US 60/062,679 22 October 1997 (22.10.97) US (71) Applicant (for all designated States except US): AMATI COMMUNICATIONS CORPORATION [US/US]; 243 Samaritan Drive, San Jose, CA 95124 (US). (72) Inventors; and (75) Inventors/Applicants (for US only): CHOW, Jacky, S. [-/US]; 880 Babb's Creek Road, Gilroy, CA 95020 (US). BINGHAM, John, A., C. [US/US]; 2353 Webster Street, Palo Alto, CA 94301 (US). (74) Agent: DOUGLASS, Thomas, C.; Beyer & Weaver, LLP, P.O. Box 61059, Palo Alto, CA 94304 (US).		(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, HU, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG). Published With international search report. (88) Date of publication of the international search report: 11 February 1999 (11.02.99)

(54) Title: METHOD AND APPARATUS FOR SUPERFRAME BIT ALLOCATION IN A DISCRETE MULTITONE (DMT) SYSTEM



(57) Abstract

A method and apparatus for supporting multiple bit allocations in a multicarrier modulation system are disclosed. Hence, symbols being transmitted or received can make use of different bit allocations. By supporting the multiple bit allocations, the multicarrier modulation system is able to support bit allocation on a superframe basis. Also disclosed are techniques for selection and alignment of superframe formats to improve system performance. In the case of data transmission systems involving different transmission schemes, different bit allocations can be used to reduce undesired crosstalk interference.

FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania	ES	Spain	LS	Lesotho	SI	Slovenia
AM	Armenia	FI	Finland	LT	Lithuania	SK	Slovakia
AT	Austria	FR	France	LU	Luxembourg	SN	Senegal
AU	Australia	GA	Gabon	LV	Latvia	SZ	Swaziland
AZ	Azerbaijan	GB	United Kingdom	MC	Monaco	TD	Chad
BA	Bosnia and Herzegovina	GE	Georgia	MD	Republic of Moldova	TG	Togo
BB	Barbados	GH	Ghana	MG	Madagascar	TJ	Tajikistan
BE	Belgium	GN	Guinea	MK	The former Yugoslav Republic of Macedonia	TM	Turkmenistan
BF	Burkina Faso	GR	Greece	ML	Mali	TR	Turkey
BG	Bulgaria	HU	Hungary	MN	Mongolia	TT	Trinidad and Tobago
BJ	Benin	IE	Ireland	MR	Mauritania	UA	Ukraine
BR	Brazil	IL	Israel	MW	Malawi	UG	Uganda
BY	Belarus	IS	Iceland	MX	Mexico	US	United States of America
CA	Canada	IT	Italy	NE	Niger	UZ	Uzbekistan
CF	Central African Republic	JP	Japan	NL	Netherlands	VN	Viet Nam
CG	Congo	KE	Kenya	NO	Norway	YU	Yugoslavia
CH	Switzerland	KG	Kyrgyzstan	NZ	New Zealand	ZW	Zimbabwe
CI	Côte d'Ivoire	KP	Democratic People's Republic of Korea	PL	Poland		
CM	Cameroon	KR	Republic of Korea	PT	Portugal		
CN	China	KZ	Kazakistan	RO	Romania		
CU	Cuba	LC	Saint Lucia	RU	Russian Federation		
CZ	Czech Republic	LI	Liechtenstein	SD	Sudan		
DE	Germany	LK	Sri Lanka	SE	Sweden		
DK	Denmark	LR	Liberia	SG	Singapore		
EE	Estonia						

INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 98/09489

A. CLASSIFICATION OF SUBJECT MATTER
 IPC 6 H04L27/26 H04L5/02

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 H04L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 495 483 A (PENDLETON MATTHEW A ET AL) 27 February 1996 see column 2, line 48 - column 3, line 10 see column 3, line 35 - line 53 see column 7, line 13 - column 8, line 14 see column 10, line 6 - line 16 see column 10, line 54 - column 11, line 12 see column 13, line 45 - line 61 see column 24, line 55 - column 25, line 60 see column 26, line 53 - column 27, line 35 see column 30, line 43 - column 34, line 52 see figures 6,7	1-9, 12-16, 19-33, 47-50
A	-/--	11,18,

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

23 October 1998

Date of mailing of the international search report

11/11/1998

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
 NL - 2280 HV Rijswijk
 Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
 Fax: (+31-70) 340-3016

Authorized officer

Koukourlis, S

INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 98/09489

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p style="text-align: center;">---</p> <p>WO 97 03506 A (AMATI COMMUNICATIONS CORP ;BINGHAM JOHN A C (US); TONG (US)) 30 January 1997</p> <p>see abstract</p>	<p>34, 35, 41, 44-46, 52-55</p> <p>10, 11, 17, 18, 34-42, 46, 51, 54, 55</p>
A	<p style="text-align: center;">---</p> <p>GB 2 303 032 A (SAMSUNG ELECTRONICS CO LTD) 5 February 1997</p> <p>see abstract see page 1, line 1 - page 6, line 5 see page 7, line 26 - page 8, line 19 see figure 4</p>	<p>1, 12, 22-24, 34-36, 41, 47</p>
A	<p style="text-align: center;">---</p> <p>US 5 479 447 A (CIOFFI JOHN M ET AL) 26 December 1995</p> <p>see abstract see column 5, line 26 - column 6, line 19</p>	<p>23, 24, 27, 28, 32, 33, 35, 36, 41, 45</p>
A	<p style="text-align: center;">---</p> <p>EP 0 653 859 A (PLESSEY TELECOMM) 17 May 1995 see the whole document</p>	<p>34-46</p>
A	<p style="text-align: center;">---</p> <p>GB 2 300 546 A (SAMSUNG ELECTRONICS CO LTD) 6 November 1996</p> <p>see page 4, line 1 - line 11</p> <p style="text-align: center;">-----</p>	<p>10, 11, 17, 18, 54, 55</p>

INTERNATIONAL SEARCH REPORT

Information on patent family members

In ternational Application No

PCT/US 98/09489

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 5495483	A	27-02-1996	NONE	
WO 9703506	A	30-01-1997	US 5680394 A AU 6478296 A EP 0838109 A	21-10-1997 10-02-1997 29-04-1998
GB 2303032	A	05-02-1997	FR 2736229 A JP 9051328 A	03-01-1997 18-02-1997
US 5479447	A	26-12-1995	NONE	
EP 0653859	A	17-05-1995	AU 688814 B AU 8149494 A CA 2174864 A WO 9513674 A GB 2283879 A,B JP 9505185 T US 5668802 A ZA 9408935 A	19-03-1998 29-05-1995 18-05-1995 18-05-1995 17-05-1995 20-05-1997 16-09-1997 18-07-1995
GB 2300546	A	06-11-1996	JP 8307385 A	22-11-1996